

## REMARKS

Claims 1-13 are pending in the application. Claims 1-13 are rejected. The drawings are objected to. All rejections and objections are respectfully traversed.

A drawing sheet including replacement Figures 1a, 1b, and 1c is submitted herewith and includes the legend Prior Art for each of the figures as requested by the Examiner.

The invention orders multimedia content. Image or video multimedia content is segmented to extract objects. Features of the objects are then extracted and associated to produce content entities. The content entities are coded to produce directed acyclic graphs of the content entities, each directed acyclic graph representing a particular interpretation of the multimedia content. Attributes of each content entity are measured and the measured attributes are assigned to each corresponding content entity in the directed acyclic graphs to rank order the multimedia content.

Claims 1-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Alatan et al., (*Image Sequence Analysis for Emerging Interactive Multimedia Services* – “Alatan”), in view of French et al., (U.S. Patent 6,266,053 – “French”).

Alatan describes segmenting video sequences to extract objects. That is all. At page 803, first full paragraph, Alatan states, “*The purpose of this paper is to provide an overview of the segmentation algorithms developed in the framework of the European COST 211 activity.*” Once the objects are segmented from the video,

Alatan is finished. The invention, however, continues to perform operations on the extracted objects.

After objects are extracted from multimedia content, the invention *extracts and associates* features of the objects themselves, to produce content entities. Alatan only extracts low-level syntactic features of the input multimedia content, such as color and motion information, to segment the content into objects. Alatan never performs operations on the extracted objects. That is simply not described at all. Table 1 at page 804 of Alatan states only “Functionality: Content and/or Feature Extraction; Possible Applications: the automatic extraction of content of interest in complex video or audio scenes.” No *features of the object* are ever extracted and associated to produce *content entities*. The sections referenced by the Examiner teach nothing of extracting and associating features from objects, only features from the input multimedia content to segment the objects. It is not the same thing. In fact, the invention can take as input the output extracted objects of Alatan to produce content entities as claimed. Further, the Applicants request the Examiner specifically identify what he regards as content entities in Alatan so that the Applicants may understand this key point of the rejection.

Further still, claimed is coding the content entities. First, as stated above, Alatan never describes content entities as claimed. Alatan describes extracted objects. The two are not the same. Alatan codes extracted objects. The invention codes content entities. The coding operations of Alatan and the invention are performed on different things. Coding an extracted object can never make obvious coding a content entity as claimed.

The invention measures attributes of each content entity. The Examiner refers generally to page 806 of Alatan as describing measuring attributes of a content entity. But, Alatan never produces the content entity as claimed, and therefore can never measure attributes of the content entity. Attributes according to the invention are an unordered set that contains properties that may provide details about parts of the entity or summarize the entity as a whole. Attributes are global to the object and may refer to such syntactic properties as color and motion, or other semantic properties of the object such as time and place. Alatan is completely silent on semantic properties of anything, even extracted objects. Alatan only extracts low-level syntactic features from multimedia content to extract objects. Page 108 describes various known object segmentation methods including Motion compensation, color analysis, motion analysis, intensity change, and change detection masks. The output of all of the above is a segmented object. Nowhere are content entities described, nor are attributes of such content entities. Alatan simply does not go that far.

French fails to cure the defects of Alatan. French represents a time varying visual scene as a directed acyclic graph of data and operators that generates a sequence of image frames over specified intervals. The Applicants request the Examiner please explain how and where French describes assigning the measured attributes to each corresponding content entity in the directed acyclic graphs to rank order the multimedia content. French never rank orders anything. French never takes as input content entities. Each node in French's graph represents data and operators (object oriented programming). The invention codes content entities as directed acyclic graphs, each directed acyclic graph representing a particular interpretation of the multimedia content. There is no "interpretation of the content as claimed in either Alatan or French. It appears that the combination of Alatan

and French, in its entirety, describes segmenting objects and directed acyclic graphs. The combination of Alatan and French falls woefully short of making the invention obvious. Therefore, the Applicants respectfully request the Examiner reconsider and withdraw his rejection based on Alatan and French.

Claims 2-5: Claimed is wherein the measured attributes of the content entity include intensity attributes, direction attributes, spatial and temporal attributes. The Examiner refers to Alatan's description of object segmentation. Content entities are not segmented objects. Alatan measures intensities, direction, spatial and temporal characteristics of pixels in a scene to perform segmentation. This has nothing to do with the claimed measuring of content entity attributes.

Claims 6-7: the Examiner generally points to pages 802, 803 and 806 of Alatan as describing attributes are arranged in an increasing rank order. Alatan ranks nothing. Further, Alatan extracts features to segment objects. The Applicant's cannot figure out exactly what the Examiner believes the claimed attributes are, and if he is confusing attributes of content entities as described in the specification and as claimed with features of multimedia content. The Examiner is requested to provide an explanation of his understanding of content entities and attributes, because his references for the rejections make little sense to the Applicants.

Claims 8-9: French traverses his directed acyclic graph according to two different approaches described in col. 10, line 51, though col. 11, line 37. The first approach is a depth-first traversal of nodes in the graph. The second is event driven. Neither approach considers measured attributes assigned to content entities as claimed. Further, the section of French referenced by the Examiner regarding

claim 9 makes no reference to summarization whatsoever. The rejections should be withdrawn for lack of any support.

Claim 10: Claimed is wherein the multimedia content is a three dimensional video sequence. Alatan at page 806 describes “*A single rigid planar scene is assumed to move in three-dimensional (3D) space.*” There, Alatan describes a single rigid (2D) scene. Just because Alatan makes an assumption does not suddenly transform a rigid 2D scene into a 3D video. Claimed is an actual 3D video with no assumptions. Alatan can never make obvious what is claimed.

Claim 11: Claimed is wherein nodes of the directed acyclic graphs represent the content entities and edges represent breaks in the segmentation, and the measured attributes are associated with the corresponding edges. According to French at col. 8, lines 15-18, “Nodes in the graph 40 are operators 50 on multimedia data, or containers 52 for references to such multimedia data stored elsewhere in the system 10.” Clearly, French describes something other than the invention, and the rejection should be withdrawn.

Claims 12 and 13: As discussed above, nothing in Alatan, particularly in pages 823, 803, or 806, describes content entities as claimed, and can therefore never describe secondary content entities or a summary of the multimedia is a selected permutation of the content entities according to the associated ranks. Alatan describes object segmentation only.

In view of the foregoing, it is respectfully submitted that the application is in condition for allowance and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at

the below listed telephone number, in order to expedite resolution of any remaining issues and further to expedite passage of the application to issue, if any further comments, questions or suggestions arise in connection with the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 50-0749 and please credit any excess fees to such deposit account.

Respectfully Submitted,  
Mitsubishi Electric  
Research Laboratories, Inc.



Andrew J. Curtin  
Registration No. 48,485

201 Broadway, 8<sup>th</sup> Floor  
Cambridge, MA 02139  
Telephone: (617) 621-7573  
Facsimile: (617) 621-7550